

## A New Species of the Genus *Parachremylus* Granger (Hymenoptera: Braconidae), a Parasitoid of *Conopomorpha* Lychee Pests (Lepidoptera: Gracillariidae) in Thailand

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*Abstract.*—*Parachremylus litchii* Belokobylskij & Maeto, new species, from Thailand is described as a parasitoid of larvae of *Conopomorpha sinensis* Bradley and *C. litchiella* Bradley, the major pests of lychee and longan in South-East Asia. The taxonomic position of *Parachremylus* and the range of the hosts of related genera of parasitoids are discussed.

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Several insect pests are seriously threatening lychee (*Litchi chinensis* Sonn.) and longan (*Dimocarpus longan* Lour.) (Sapindaceae) growers. They are the fruit borer (*Conopomorpha sinensis* Bradley), leaf miner (*Conopomorpha litchiella* Bradley), longan sucking bug (*Tessarotoma papillosa* Drury), fruit piercing moth (*Othreis fullonia* (Clerck)), and twig borer (*Zeuzera coffeae* Nietner) (Menzel 2002).

*Conopomorpha sinensis*, the lychee stem-end borer and the lychee fruit borer in China, Thailand and India, is the major pest of lychee and longan in these countries. *Conopomorpha sinensis* and the related *C. litchiella* both attack lychee and longan, the latter preferring to mine leaves and shoots (Bradley 1986). There have been only tentative reports on braconid parasitoids of the pest *Conopomorpha* borers: *Phanerotoma* sp., *Pholetesor* (*Apanteles*) sp., and *Colastes* sp. (Menzel 2002, Anupunt and Sukhvibul 2005), but possibly information about *Colastes* is due to misdetermination. Here we report a new braconid of the genus *Parachremylus* Granger as a larval parasitoid of *C. sinensis* and *C. litchiella*.

The genus *Parachremylus* with type species *P. seyrigi* Granger was originally described from Madagascar (Granger 1949); this genus occurs also in continental Africa—Nigeria and Niger (Wharton 1993). Two additional species of this genus have already been recorded from the Oriental region. *Parachremylus oblongus* (Papp) was described from India in the genus *Avga* Nixon (Papp 1990, 1997), and *P. temporalis* Belokobylskij from Brunei (Belokobylskij 1999). A fourth species of this genus, similar to *P. temporalis*, is described below from Thailand. The systematic position of this genus is disputable. *Parachremylus* is included in the subfamily Exothecinae (tribe Avgini: Belokobylskij 1993), or conventionally in subfamily Hormiinae (Wharton 1993). In spite of the different understanding of the contents of subfamilies, the position of this genus close to *Avga* Nixon is suggested by both authors. Belokobylskij (1993) discussed the relationships of these genera with *Parahormius* Nixon, *Pseudohormius* Tobias & Alexeev and *Allobracon* Gahan (= *Leurinion* Muesebeck), which share the loss of the prepectal (epicnemial) carina on the

mesosoma. Wharton (1993) provisionally placed *Avga* near *Parahormius* and *Pseudohormius* and showed the possible relationship of *Avga* and *Parachremylus* (shared granulate mesonotal sculpture and the poorly developed propleural flange). However, in his opinion, *Allobracon* does not appear to be closely related to *Parachremylus* in spite of it sharing a number of features with *Avga* and *Parahormius*.

The host of *Parachremylus* has not been known till now. The new species described below as *P. litchii* sp. nov. was reared from larvae of *Conopomorpha sinensis* and *C. litchiella* (Gracillariidae), both important pests of lychee and longan trees in South-East Asia. The members of related genera of the tribe Avgini (*Parahormius*, *Avga*, *Allobracon*) are also recorded as parasitoids of the leaf-rollers or leaf-miners of the families Tortricidae, Gracillariidae, Lyonetiidae, Cosmopterigidae, Coleophoridae, and Gelechiidae (Belokobylskij 1993, Wharton 1993) as well as rarely (recorded for *Allobracon*) of leaf-mining Coleoptera (Wharton 1993).

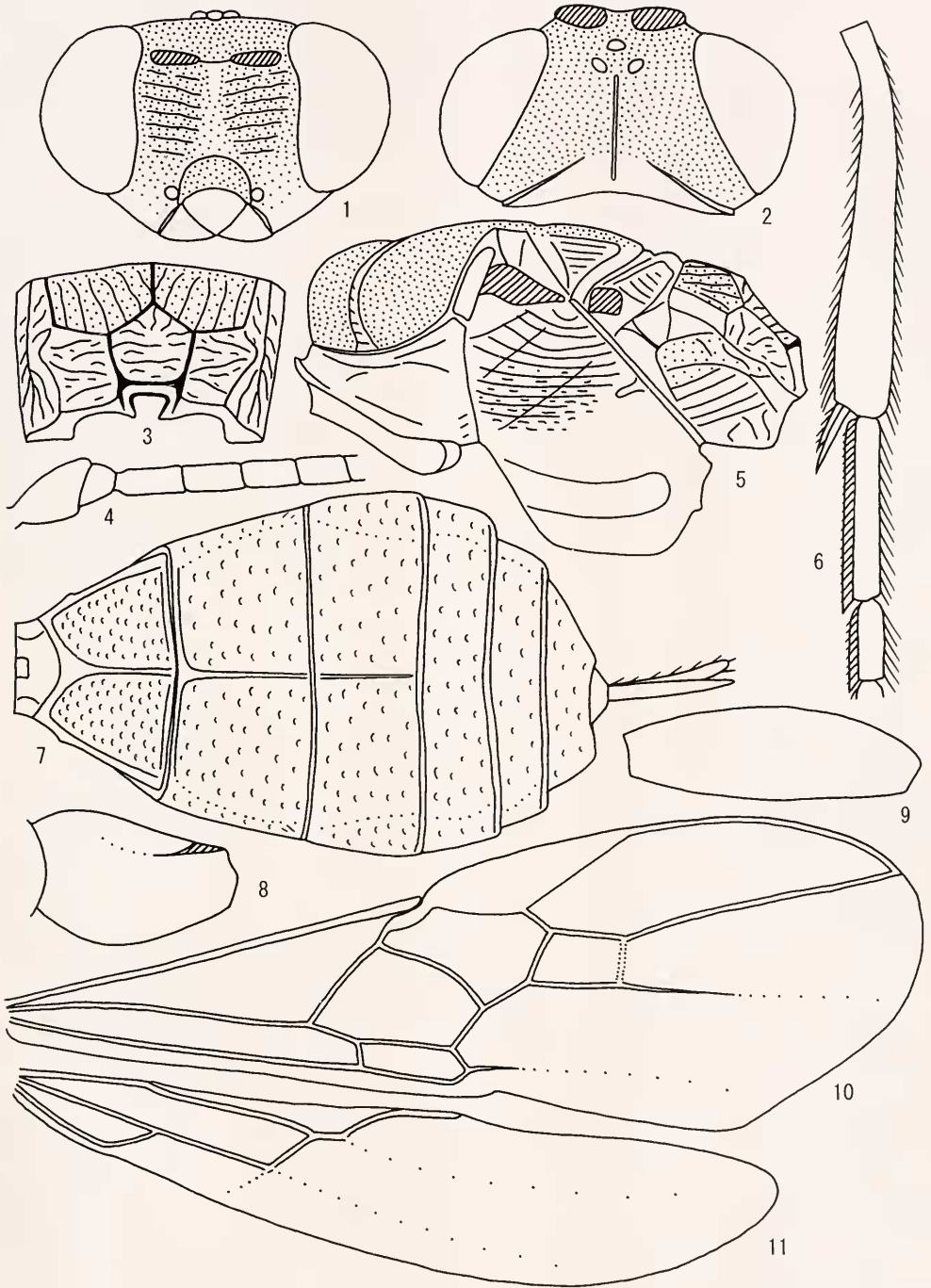
The terms of wing venation are used as defined by Belokobylskij and Tobias (1998). The following abbreviations are used: POL—postocellar line; OOL—ocular-ocellar line; Od—maximum diameter of lateral ocellus; NIAES—National Institute of Agro-Environmental Sciences (Tsukuba, Japan); ZISP—Zoological Institute, Russian Academy of Sciences (St. Petersburg, Russia).

*Parachremylus litchii* Belokobylskij & Maeto, new species  
(Figs 1–11)

*Holotype female*.—"Horticultural Research Center, Chiang Rai, Thailand, viii, 1996, Supatra Dolsopon", "Host: *Conopomorpha litchiella* larvae on Lychee or Longan" (NIAES). Paratypes. 2 females, 1 male, with the same labels as holotype (NIAES, ZISP); 5 females, "Horticultural Research Center, Chiang Rai, Thailand, 6.

vi, 1997, Supatra Dolsopon", "Host: *Conopomorpha sinensis* larvae" (NIAES, ZISP).

*Description*.—Female. Body length 2.6–2.8 mm; fore wing length 2.5–2.6 mm. *Antennae*: thickened, almost filiform, 29–30-segmented, 1.1–1.2 times longer than body. Scapus 1.7–2.0 times longer than wide. First flagellar segment 2.5–2.8 times longer than its apical width, 1.1–1.2 times longer than second segment. Penultimate segment 2.0–2.3 times longer than wide, 0.6–0.7 times as long as first flagellar segment, 0.7–0.75 times as long as apical segment; the latter with distinct spine apically. *Head*: width 1.8–2.0 times its median length, 1.25–1.4 times width of mesoscutum. Temple very strongly and almost linearly narrowed behind eye (dorsal view). Transverse diameter of eye (dorsal view) 5.5–7.0 times longer than temple length (7.0–7.7 times if measured on straight line). Ocelli small, in triangle with base 1.1–1.15 times its sides. POL 0.7–1.0 times Od, 0.3–0.5 times OOL. Vertex with narrow median longitudinal furrow. Occipital carina dorsally distinctly curved towards ocelli, rather widely interrupted medially; not fused with hypostomal carina ventrally being obliterated for a short distance. Eye large, sub-round, glabrous, 1.1–1.2 times as high as broad. Malar space 0.25–0.3 times height of eye, 0.8–0.9 times basal width of mandible. Face width 0.9 times height of eye and 1.2–1.25 times height of face and clypeus combined. Malar suture absent. Clypeal suture rather distinct and complete. Clypeus weakly convex. Hypoclypeal depression sub-round, its width 0.8–0.9 times distance from edge of depression to eye, 0.35 times width of face. Head below eyes (front view) strongly and almost linearly narrowed. *Mesosoma*: length 1.5–1.55 times its height. Mesoscutum highly and almost perpendicularly raised above pronotum (lateral view), with rather fine longitudinal medioposterior keel (dorsal view). Notauli rather narrow, shallow anteriorly on vertical surface and very shallow to almost



Figs 1–11. *Parachremylus litchii* sp. nov. 1, Head, frontal view. 2, Head, dorsal view. 3, Propodeum. 4, Six basal segments of antenna. 5, Mesosoma, lateral view. 6, Hind tibia and two basal segments of hind tarsus. 7, Metasoma, dorsal view. 8, Hind coxa. 9, Hind femur. 10, Fore wing. 11, Hind wing.

absent on dorsal surface, finely sculptured. Prescutellar depression short, shallow, finely crenulate-granulate, 0.15–0.2 times as long as scutellum. Scutellum almost flat. Metanotum medially with small and obtuse tubercle. Subalar depression rather shallow, wide, densely and curvedly striate with fine granulation anteriorly. Sternauli shallow, rather wide, weakly curved, entirely smooth. *Wings*: Length of fore wing 2.8–3.0 times its maximum width. Radial cell not shortened, metacarpus 1.3 times longer than pterostigma. Pterostigma rather wide, 3.1–3.7 times longer than wide. Radial vein arising a little or rather distinctly before middle of pterostigma. Second radial abscissa 1.5–2.3 times longer than first abscissa, 0.25–0.3 times as long as the straight third abscissa, 1.15–1.25 times longer than the weakly curved first radiomedial vein. Second radiomedial cell short, weakly narrowed towards apex, its length 1.5–1.8 times maximum width, 0.9–1.1 times length of brachial cell. First medial abscissa rather distinctly S-shaped. Recurrent vein 0.9–1.0 times as long as second abscissa of medial vein. Discoidal cell 1.55–1.65 times longer than wide. Nervulus strongly postfurcal, distance from nervulus to basal vein nearly twice nervulus length. Parallel vein arising a little behind middle of distal margin of brachial cell. Hind wing 4.5–4.7 times longer than maximum width. First abscissa of costal vein 0.85–0.9 times as long as second abscissa. First abscissa of mediocubital vein 1.15–1.2 times longer than second abscissa. Recurrent vein short, unsclerotized, interstitial, curved toward base of wing. *Legs*: Hind coxa large, 1.5–1.6 times longer than wide, 0.7–0.75 times as long as hind femur. Hind femur wide, 3.1–3.2 times longer than wide. Hind tibia thickened towards apex. Hind tarsus 1.1 times longer than hind tibia; hind basitarsus 0.6–0.65 times combined length of second-fifth segments (without pretarsus). Second tarsal segment 0.4–0.45 times as long as basitarsus, 1.2–1.3 times longer than fifth segment (without pretarsus).

First-fourth segments of hind tarsus ventrally with wide and transparent flanges, which are pointed on the tops of each segment. *Metasoma*: 1.7–2.0 times longer than its maximum width, 0.9–1.1 times as long as head and mesosoma combined. First tergite strongly, uniformly and linearly widened from base to apex; with small spiracular tubercles before its middle; laterally with distinct high and rather wide carinae; fine dorsal carinae fused in basal 0.3 and then extending to apex as a single, elevated, median carina; dorsople absent. Apical width of first tergite 2.4–2.7 times its basal width; its length 0.6–0.65 times apical width. Second suture rather distinct and convex. Second and third tergites with rather distinct and fine longitudinal median carina. Median length of second tergite about half its basal width, equal to or 1.1–1.2 times length of third tergite. Combined median length of second and third tergites nearly equal to basal width of second tergite, 0.7–0.75 times maximum width of tergites. Ovipositor sheath (visible part in lateral view) 1.1–1.3 times longer than first tergite, 1.0–1.2 times longer than hind basitarsus, 0.25–0.4 times as long as mesosoma, 0.15–0.17 times as long as fore wing. *Sculpture and pubescence*: Head very densely and minutely granulate, face additionally with rather fine and irregular striation. Mesoscutum very densely and distinctly granulate, with rather narrow and long rugulosity in medioposterior half. Scutellum finely and densely granulate. Mesopleuron almost smooth in lower half. Metapleuron coarsely, regularly and curvedly striate for the most part, with fine granulation between striae and anteriorly. Propodeum almost entirely coarsely and rather sparsely striate, striae in areola more or less transverse and partly undulate or rugulose, with fine granulation partly; with distinctly delineated basolateral areas; areola wide, its length 1.0–1.2 times maximum width; dorsal carina 0.8–1.0 times as long as areola fork. Hind coxa smooth; hind femur finely punctulate with



very fine granulation dorsally, smooth ventrally. Metasoma entirely densely granulate, granulation becoming finer towards apex of metasoma. Mesoscutum entirely shortly and very densely setose. Hind tibia dorsally with rather short, dense and semi-erect setae, its length 0.35–0.55 times maximum width of tibia. *Colour*: Head and anterior half of mesosoma (including mesoscutum) yellow, posterior part of mesosoma and metasoma pale yellow, metasoma additionally often with greenish tint. Antenna reddish brown or brown, scapus mostly yellow. Palpi pale yellow. Legs yellow, all tarsi (especially posterior ones) more or less brown. Ovipositor sheath brown in basal half and black in apical half. Fore wing faintly infusate. Pterostigma brownish yellow.

*Male*.—Body length 2.0 mm; fore wing length 2.4 mm. Head width 2.1 times its

median length. Transverse diameter of eye (dorsal view) 8.8 times longer than temple length if measured on straight line. Antenna 28-segmented. Otherwise similar to female.

*Diagnosis*.—The new species is very similar to *P. temporalis* Belokobylskij from Brunei (Belokobylskij 1999) and differs in having the recurrent vein as long as second abscissa of medial vein, the nervulus strongly postfurcal, the pterostigma rather wide, the hind femur wide, the second tergite short, the face rather finely striate, and the propodeum almost entirely coarsely rugose-striate.

*Host*.—*Conopomorpha sinuensis* Bradley and *C. litchiella* Bradley (Gracillariidae).

*Distribution*.—Thailand.

*Etymology*.—This species is named after the name of the fruit tree—lychee (*Litchi chinensis* Sonn.)—on which their hosts develop.

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KEY TO SPECIES OF THE GENUS *PARACHREMYLUS* GRANGER

1. Temple longer; transverse diameter of eye (dorsal view) 4.0–5.0 times as long as temple length. Malar space larger than basal width of mandible. Mesopleuron smooth in upper half, striation partly present in subalar depression only. 1<sup>st</sup>–4<sup>th</sup> segments of hind tarsus with narrow and partly indistinct flanges ..... 2
- Temple shorter; transverse diameter of eye (dorsal view) 5.5–7.0 times as long as temple length. Malar space less than basal width of mandible. Mesopleuron distinctly curvedly striate in upper 0.4–0.5. 1<sup>st</sup>–4<sup>th</sup> segments of hind tarsus with wide flanges ..... 3
2. Notauli complete, rather deep posteriorly. Metacarpus 1.2–1.3 times as long as pterostigma. 1<sup>st</sup> flagellar segment 3.5–3.7 times as long as apical width. Median length of 2<sup>nd</sup> and 3<sup>rd</sup> metasomal tergites combined a little larger than basal width of 2<sup>nd</sup> tergite. Propodeum mostly coarsely and sparsely striate. Body length 2.2 mm.—Madagascar *P. seyrigi* Granger
- Notauli incomplete, almost absent posteriorly. Metacarpus 1.5 times as long as pterostigma. 1<sup>st</sup> flagellar segment 3.0 times as long as apical width. Median length of 2<sup>nd</sup> and 3<sup>rd</sup> metasomal tergites combined 1.3 times basal width of 2<sup>nd</sup> tergite. Propodeum mostly smooth. Body length 2.0 mm.—India ..... *P. oblongus* (Papp)
3. Pterostigma narrow, 5.0 times as long as maximum width. Recurrent vein of fore wing about twice as long as second abscissa of medial vein. Nervulus not strongly postfurcal, distance from nervulus to basal vein 0.7 times nervulus length. Hind femur 3.5 times as long as wide. 2<sup>nd</sup> tergite 0.6 times as long as its basal width. Face almost entirely distinctly transversely striate. Propodeum within background areolation sparsely striate, mostly smooth. Body length 2.3 mm.—Brunei ..... *P. temporalis* Belokobylskij

- Pterostigma rather wide, 3.1–3.7 times as long as maximum width. Recurrent vein of fore wing almost as long as second abscissa of medial vein. Nervulus strongly postfurcal, distance from nervulus to basal vein nearly twice nervulus length. Hind femur 3.1–3.2 times as long as wide. 2<sup>nd</sup> tergite about 0.5 times as long as its basal width. Face finely and partly indistinctly transversely striate and with dense fine granulation. Propodeum within background areolation almost entirely coarsely rugose-striate with fine granulation partly. Body length 2.0–2.8 mm.—Thailand . . . . . *P. litchii* sp. nov.

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